

# Things to do while you are waiting

- Course slides are available at:  
<https://hprc.tamu.edu/training/applying.html>
- Read the information at:  
<https://hprc.tamu.edu/policies/allocations.html>

# HIGH PERFORMANCE RESEARCH COMPUTING

Applying for Allocations on HPRC Clusters

HPRC Training  
February 16, 2024

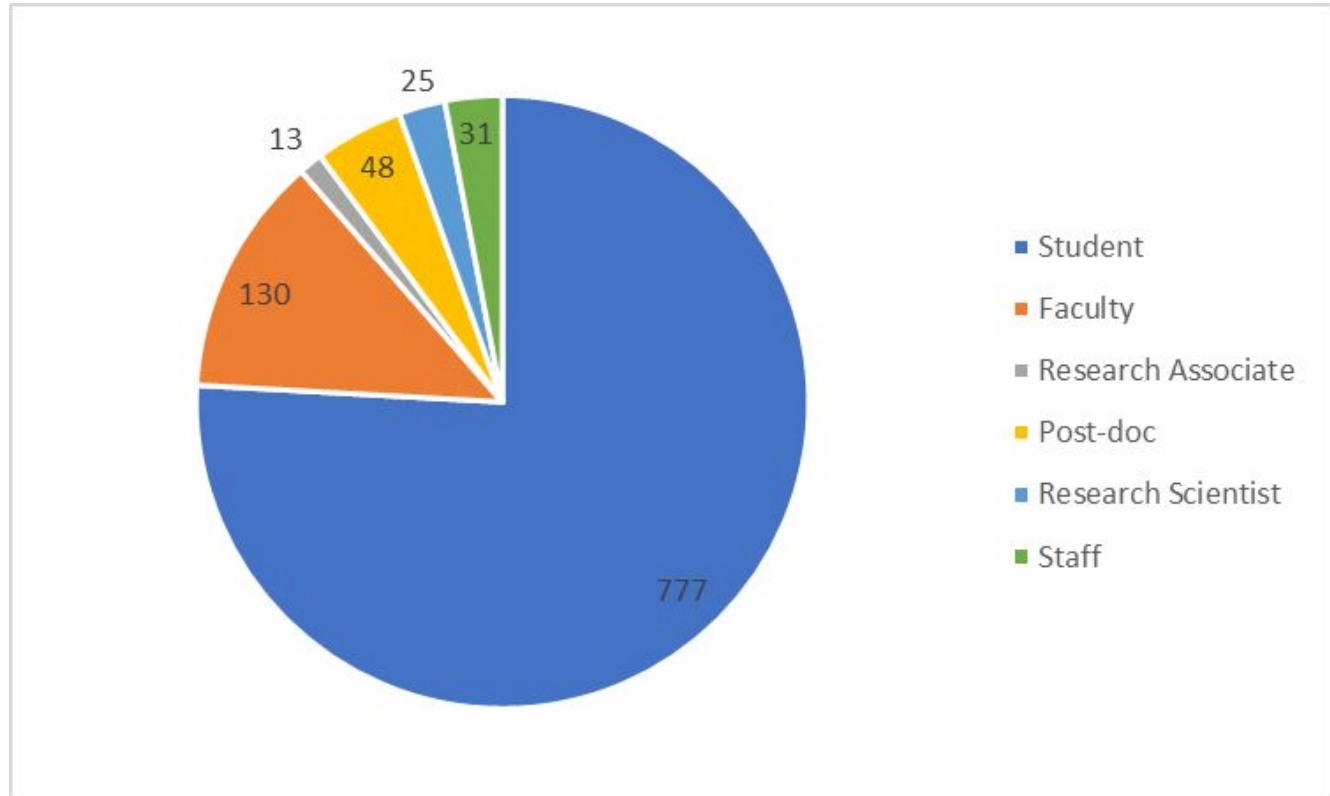


High Performance  
Research Computing  
DIVISION OF RESEARCH

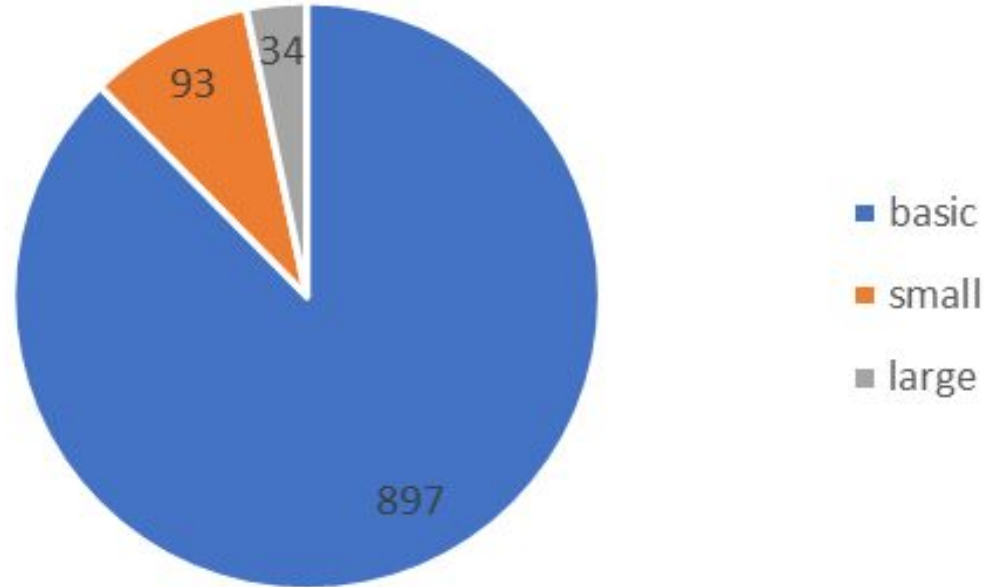
# Outline

- Introduction to terms, clusters, and application levels
- Basic applications
- Startup Applications
- Research Applications
- ACCESS ID and ACES Allocations

# Who Uses HPRC?



# What kinds of Accounts?



Total: 1024

# Definitions of Terms

Term	Definition
Allocation	An amount of SUs assigned to a specific user.
Fiscal Year (FY)	A time period that starts on September 1, and ends on August 31 next year.
HPRC	High Performance Research Computing at TAMU.
Principal Investigator (PI)	A faculty member or research staff qualified to apply for allocations.
Project Account	A 12-digit number used by users to submit jobs on machines.
Service Unit (SU)	The equivalent of 1 hour of wall clock time running on one processing core.
User	Someone with a login account on one or more of the resources.

# Principal Investigator (PI) Eligibility

Only active faculty members and permanent research staff (subject to allocation committee review and approval) of Texas A&M System Members **headquartered** in Brazos County can serve as a *Principle Investigator* (PI).

Adjunct and Visiting Professors do not qualify independently but can use HPRC resources as part of an eligible PI's research group.

Note that:

- A researcher can work on more than one project and with more than one PI

[www.hprc.tamu.edu/policies/allocations.html](http://www.hprc.tamu.edu/policies/allocations.html)

# Current Clusters Available

- ACES
- FASTER
- Grace
- Terra
- Lonestar6 (located at the University of Texas)



# Basic, Startup, and Research Allocation Applications

Terra, Grace, FASTER, and Lonestar6

<https://hprc.tamu.edu/apply>

# Three Types/Levels of Allocations

## Basic allocations

Users can apply for an account with basic allocations at any time, subject to approval of their PI. Basic allocations are approved by HPRC staff. A user can have only one basic allocation per fiscal year.

## Startup allocations

Startup allocations support low intensity projects (e.g., small scale analyses used for teaching, benchmarking to assess the SU needs for a future research allocation). Startup allocations are approved by HPRC staff.

## Research allocations

Research allocations are for medium to high intensity projects. PIs can have more than one research allocation, but are limited by the per-machine SU cap per fiscal year.

**Accounts expire at the end of the fiscal year.  
All users must apply each fiscal year.**

# Allocation Availability on Machines

Machines	Basic Allocation	Startup Allocation	Research Allocation
Grace	Available	Available	Available
Terra	Available	Available	Available
FASTER	Available	Available	Not Available
Lonestar6	Not Available	Available	Available

# Basic Allocation Applications

Applications for Basic Allocations must include the following:

- Eligible Principal Investigator (PI) - Choose someone who knows you and meets the criteria (see previous slide); be sure to ask your graduate advisor or research professor first.
- Summary of your research, including the purpose of your research, how the allocation will be used, and the software you will use in your work.

Note: Basic allocation applications are reviewed daily. You can expect a response within 24 hours. Once the allocation is set up, it takes about an hour to finish processing before you can use it.

# Basic Applications

Allocation Type	Who can apply?	Minimum SUs per Allocation per Machine	Maximum SUs per Allocation per Machine	Maximum Total SUs per Machine	Maximum Number of Allocations per Machine	Reviewed and approved by
Basic	Faculty, Research Scientists, Post-Docs*, Research Associates*, Students*, Visiting Scholars/Students*, Qualified Staff†	20,000	20,000	20,000	1	HPRC Staff

\* Requires a PI

† PI required if not PI Eligible

## Research Summary Example

I will be conducting geothermal energy systems simulations using TOUGH+ code (fortran language). The simulations use very fine discretization (100,000+ elements/gridblocks), therefore solving more than 300,000 equations for transport in porous media. The work being performed is fully implicit, using Jacobian matrices and Newton-Raphson iterations with high degree of accuracy, requiring high computational effort.

## Research Summary Example

For a course \* - Account access is requested in order to participate in the course STAT 624: Computing Tools for Data Science. Activities will consist of uploading small datasets, developing Python scripts and Jupyter notebooks, and using SLURM with shell scripts to execute simple Python scripts that require basic parallel processing.

\* Ask your professor if you do not know what to write for the research summary.

# Application Example

SUBMISSION DATE		STATUS	VERSION	APPLICATION ID
2023-08-01 16:48:16		approved	current	35820
APPROVAL DATE		APPROVED BY	FISCAL YEAR	ORIGINAL APPLICATION
2023-08-01 17:45:37		stebenne	2024	This is the original application
NAME		NET ID	USER TYPE	APPLICATION TYPE
Sandra Nite		s-nite	r-scientist	Basic
CONTACT INFO.			ALLOCATION REQUESTED	COURSE
Official Name	Nite, Sandra Bonorden			
Daytime Phone	(979) 248-0653		terra (20,000 SUs)	
Official Email	s-nite@tamu.edu		grace (20,000 SUs)	
Alternate Email	sgnite@gmail.com		faster (20,000 SUs)	
Department	HPRC			
PI NET ID	PI NAME	PI PHONE	PI EMAIL	
s-nite	Nite, Sandra Bonorden	(979) 248-0653	s-nite@tamu.edu	
RESEARCH DESCRIPTION				
Using the system for HPRC functions.				



# Startup Allocation Applications

Startup applications are useful for two main purposes:

1. Research or class activities require more computing time than the basic allocation provides. Eligible PIs can apply for a startup allocation to provide more SUs for your research. PIs can request students be added to the account(s). Then the PI or HPRC staff (through a help ticket - [help@hprc.tamu.edu](mailto:help@hprc.tamu.edu)) can transfer SUs to a student account.
2. Eligible PI needs a research allocation for a significant number of SUs. A Startup allocation is a great tool for benchmarking to calculate the SUs needed for the section of the research application that requires those calculations.

Note: Startup allocation applications are reviewed on weekdays. You can expect a response within 24 hours. After the allocation is set up, it takes about an hour for it to finish processing and be available for use.

# Startup Allocation Applications

Applications for Startup Allocations must include the following:

1. Research description
2. Justification for the machines requested
3. Justification for the service units (SUs) requested
4. Additional researchers to whom SUs will be allocated (optional)
5. Funding (if any) sponsor and annual amount

NOTE: Startup accounts are commonly used for PIs to learn about the number of SUs required for tasks they perform so that the justification for a Research Account will be accurate and reasonable to the research allocation committee.

# Startup Allocations

<b>Allocation Type</b>	<b>Who can apply?</b>	<b>Minimum SUs per Allocation per Machine</b>	<b>Maximum SUs per Allocation per Machine</b>	<b>Maximum Total SUs per Machine</b>	<b>Maximum Number of Allocations per Machine</b>	<b>Reviewed and approved by</b>
<b>Startup</b>	Faculty, Research Scientists, Qualified Staff‡	<b>20,000</b>	<b>200,000</b>	<b>400,000</b>	<b>2</b>	<b>HPRC Staff or Executive Director</b>

‡ Subject to PI Eligibility

# Example

PI NET ID	PI NAME	PI PHONE	PI EMAIL
s-nite	Nite, Sandra Bonorden	979 458 8415	s-nite@tamu.edu
<b>RESEARCH DESCRIPTION</b>			
I am studying the sequences of DNA in bird flu to search for solutions to the current bird flu epidemic. I will be using Python based machine learning classification tools.			
<b>JUSTIFICATION (for machines requested)</b>			
Grace has OpenFoam capabilities that I need to process the xxx.			
<b>JUSTIFICATION (for hours requested)</b>			
I plan to run 2000-4000 sequences that require 20-40 SUs each.			
<b>ADDITIONAL RESEARCHERS</b>			
	<b>Name</b>	<b>Hrs</b>	<b>Email</b>
	Jane Doe Grace	200000	jane.doe@tamu.edu
<b>FUNDING</b>			
	<b>Sponsor</b>	<b>Annual amount</b>	
	NSF	400,468	

# Research Allocation Applications

The High Performance Research Computing Resource Allocation Committee (HPRC-RAC) reviews all proposals for allocations exceeding 200K SUs/academic year. The merit criteria to evaluate each proposal is based on the scientific rationale for the proposed work, the proposed methodology and research plan, the careful analysis of the computational needs as well as prior (if relevant) performance, including actual usage, agreement to acknowledge the High Performance Research Computing (HPRC) group in publications and other vehicles for scientific dissemination.

Note: It usually takes 2-3 weeks for the committee review to be completed.

# Research Allocations

Allocation Type	Who can apply?	Minimum SUs per Allocation per Machine	Maximum SUs per Allocation per Machine	Maximum Total SUs per Machine	Maximum Number of Allocations per Machine	Reviewed and approved by
Research (Terra)	Faculty, Research Scientists, Qualified Staff‡	300,000	5,000,000	5,000,000	Determined by HPRC-RAC	HPRC-RAC
Research (Grace)	Faculty, Research Scientists, Qualified Staff‡	300,000	10,000,000	10,000,000	Determined by HPRC-RAC	HPRC-RAC
Research (Lonestar6 )	Faculty, Research Scientists, Qualified Staff‡	300,000	2,000,000	2,000,000	Determined by HPRC-RAC	HPRC-RAC

‡ Subject to PI Eligibility

# Research Allocation Applications

Applications for Research Allocations must include a PDF **project description** with the following:

1. Problem Statement – up to 1 page, describing the desired outcomes of the project.

Be sure to put the title of the project at the top of the page. Describe the research, including any research questions you have.

2. Background – up to 1 page, describing how resources will be used.

Give some information about the research, what is known about the topic, and how your research will add to the field of knowledge.

3. Methodology – up to 1 page, describing the computational methodology & applications.

In this section, explain how you will use the clusters and any software to complete specific tasks for the project.

# Research Allocation Applications

Applications for Research Allocations must include a PDF project description with the following:

4. Research Plan – up to 1 page, describing the research schedule, with expenditure of resources. If allocations are not used uniformly over the year, an estimate by quarters is required.

Give the steps to be completed as you enact the research and where the use of high performance computing is integrated into the project.

5. Requirements Analysis - up to 2 pages, detailing the basis for the requested computer time. Large allocations must exhibit an understanding of application efficiency, scaling, and provide accurate estimations of time requirements.

Show details of the calculation of how many SUs you need on each cluster, showing the tasks to be performed, how many runs are needed, and how many SUs are needed per run to reach your total request.

The total length of the project description should be up to 5 pages, excluding required reports of results of prior support (required for renewals), references, and attachments.



# Common Application Errors

What will cause my application to be rejected?

## Basic Applications

- An ineligible sponsoring PI
- Poor research description
- PI not identified

## Startup Applications

- Applicant is not an eligible PI
- Poor research description
- No justification for machines or hours requested

## Research Applications

- Insufficient justification for hours requested
- No report filed for prior allocation(s)

**REJECTED**

# Lonestar6 Allocation Application

- The Lonestar6 system is a result of a collaboration between University of Texas, Texas Tech University, the University of North Texas, Texas A&M University, and several research centers.
- The account setup process is different and managed by the Texas Advanced Computing Center (TACC)
- The Lonestar system supports researchers across Texas.

## Lonestar6 Additional Instructions

- The Lonestar6 startup and research allocation application is the same as that for Grace, Terra, and FASTER
- HPRC does not manage these allocations independently.
- Watch your email for additional instructions after being awarded SUs on Lonestar6

# HPRC Premium Service Packages

	Computing Time (SU, core-hour)	Computer Storage (TB)	Staff Consultant (Hour)
TAMU System Users (TAMU/TAMUS/FED Rate)	\$0.03	\$35	\$75
Non-TAMU System Users (External or Outside Academic)	\$0.04	\$45	\$90
Other Users (Commercial/Business)	\$0.05	\$55	\$115



# ACES

ACCELERATING COMPUTING  
FOR EMERGING SCIENCES

# ACES Allocation Applications

[ACES](#) is our newest computing platform and is available to national researchers, not just Texas A&M University researchers. You can learn more about what it has to offer here:

<https://hrpc.tamu.edu/resources/>

An ACCESS ID is required to obtain SUs on ACES.

ACCESS ID application can be found here:

<https://operations.access-ci.org/identity/new-user>

More information about the ACCESS application process can be found here:

<https://allocations.access-ci.org>

# ACCESS Allocation Levels



There are three levels of allocations for ACES available through ACCESS:

- **Explore** - for small resource amounts to try out resources, run benchmarks; assign small-scale classroom activities; develop or port codes; conduct thesis or dissertation work
- **Discover** - for modest-scale research and other resource needs
- **Accelerate** - for more substantial resource amounts for research

<https://allocations.access-ci.org/project-types>

# Explore ACCESS Request

Applicants must submit:

- A public overview of the research and details on how ACCESS resources will support the research
- NSF biosketch, CV or Resume for PI and co-PIs (pdf)
- Active funding, if applicable
- Letter of collaboration (for graduate students)
- Data fields:
  - Title of project
  - Research keywords
  - Field of science

<https://allocations.access-ci.org/prepare-requests>



# Discover ACCESS Request

Applicants must submit:

- One-page description of proposed use of ACCESS resources
  - Project Information
    - Title of project
    - Title of supporting grant, if funded
    - Agency and funding award number
    - Name & institution of project lead
  - Research or Education Objectives (e.g., research questions, classroom exercises, gateway operations) and how cyberinfrastructure resources will assist
  - Description of resource needs
- Public Abstract to paste into online form (may be posted on web page)
- CVs or resumes of lead investigators

<https://allocations.access-ci.org/prepare-requests>

# Accelerate ACCESS Request

Applicants must submit:

- Project Information (see previous slide)
- Public Abstract - summary of science questions; summary of computational plan
- Science Objectives - align with funded projects
- Title of supporting grant, Agency and award number
- Estimate of Compute, Storage, and Other Resources
- Software & Specialized Needs
- Team and Team Preparedness (team qualifications and readiness)
- CV's for PI and co-PIs or NSF- or NIH-formatted biosketches

<https://allocations.access-ci.org/prepare-requests>

# Questions



## Quick Links to Resources

- [Resource Allocation Policies](#)
- [Account Information/Requirements](#)
- [Cluster Information](#)
- [Cluster Account Application \(Terra, Grace, FASTER, Lonestar6\)](#)
- [ACCESS Application \(ACES & FASTER\)](#)
- [HPRC Knowledge Base](#)
- [HPRC YouTube Channel](#)

# Thank you

Contact: [help@hprc.tamu.edu](mailto:help@hprc.tamu.edu)